★ OCCUPATIONAL ★ HAZARDS

SEPTEMBER 1941

There's Profit in PREVENTION

Storage battery plant gets Profits in Air

In this ISSUE

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THE ONLY MANAGEMENT PUBLICATION DEVOTED TO THE ENGINEERING CONTROL OF
Dusts • Fumes • Vapors • Gases • Organic Solvents • Dermatitis • Industrial Sanitation • Industrial Health and Safety

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Blue Monday . . .

One large industrial company determined to find the reason for all the accidents which occur on Monday. The first working day of the week seems to have a hoodoo in many plants. In making the analysis, it was found that the accident rate declined until Thursday, at which time it jumped higher again. Friday was found to be the safest day of all.

On Monday, two factors combined to make the accidents numerous. In the first place, many workers lose their stride over the week-end, and figuratively speaking, must learn their jobs all over again. In the second place, the activities of the so-called days of rest may have resulted in fatigue—that Monday morning tired feeling.

Thursday is the second worst day because the peak has been passed, and the jobs begins to seem monotonous. The same routine, over and over, brings an overconfidence and carelessness.

Friday, however, is pay day, and the week-end holiday just ahead, seems to pep up the workers. Anticipation makes a man alert.

Fatigue factor

Sidelights to this analysis revealed that about one-fourth the accidents in industry are due to fatigue. Beginning in the morning, accidents gradually increase until noon. After lunch, they diminish sharply and then begin to rise again during the afternoon, usually, reaching a peak higher than the first. It was concluded that the personal habits of the workers entered into safety while at work—the personal habits at home. The worker with a distressed background, worrying about his private problems, is one who does not have his mind on his work.

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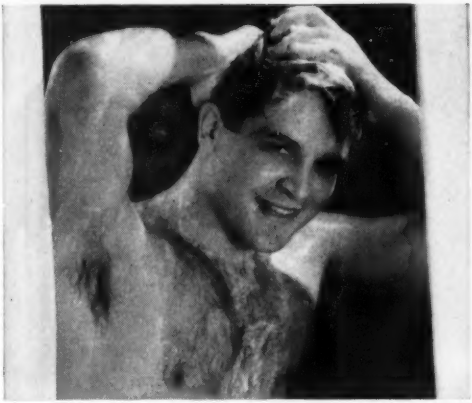

DON'T FORGET SHOWERS WHEN PLANNING WASHROOMS

•

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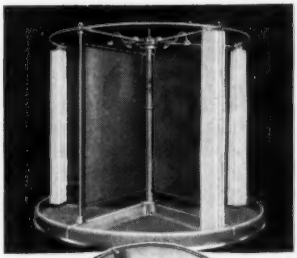
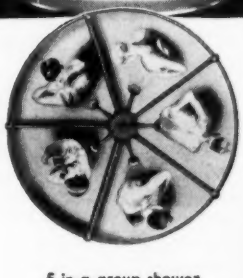
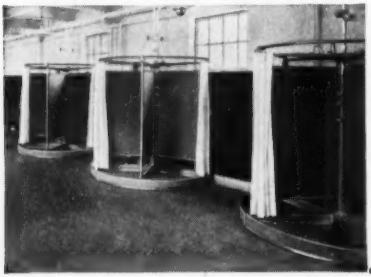
Layout suggestions by our experienced Washroom Consultants will help you in planning economical washrooms. BRADLEY WASHFOUNTAIN CO., makers of the well-known group wash fixtures—Bradley Washfountains—2259 W. Michigan Street, Milwaukee, Wis.





5-in-a-group shower



BRADLEY
MULTI-STALL SHOWERS

OCCUPATIONAL Hazards

SEPTEMBER 1941
VOLUME 3 NUMBER 12

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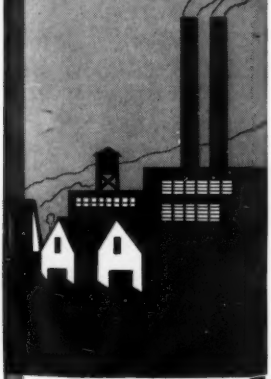
Jack Weiss, Editor



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Profits in Air

AN EFFECTIVE exhaust system for removal and collection of the fine floating dust from portable grinding has been installed by the Cincinnati Bickford Tool Company in their new enlarged finishing department. Ten stations, provided with grill openings beneath the grinding operations, have been designated for this work.

They have been sized and located in a manner that assures efficient control of the dust without interfering with movement of the complicated and numerous castings entering into the construction of the company's radial drills.

A total of 51,000 c.f.m. is exhausted from this department setting up an air movement which carries the generated dust downward from the grinding tools directing it away from the workmen and through the grilled openings beneath the work. The workroom is completely free from the usual haze where such operations are not exhausted.

Downdraft Exhaust

Four stations are provided with floor grills five feet by ten feet. The center section of each of these openings is blanked off to reduce the net opening to thirty-five square feet, through which air is pulled downward. These stations were designed to handle the larger castings which include arms, bases and columns of the machine tools.

One of these four grates is shown in Figure 1 where the workmen were grinding the arm castings at the time the picture was

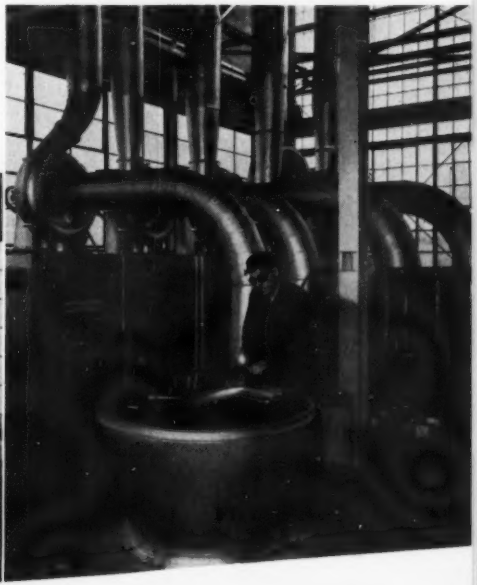
made. Two four feet by six feet tables, twenty inches high, were provided for grinding of the head castings.

For the control of dust generated in the grinding of gear cases and miscellaneous smaller parts four circular tables thirty inches high were installed. These tables also have grill tops and are four feet in diameter. Tables of this type are illustrated in Figure 2.

Equipment

The exhaust and dust collecting equipment consists of five Type D Roto-Clone combined exhaust fans and dust collectors as manufactured by the American Air Filter Company. They are arranged in a battery in the corner of the casting finishing department and are connected to the various grinding stations by exhaust ducts located in pipe trenches. The underground installation of piping and the location of collectors in the far corner have been instrumental in maintaining the entire floor space of the department free from obstructions. Flexibility of production and savings in power were considerations in arranging the installation in 5 groups.

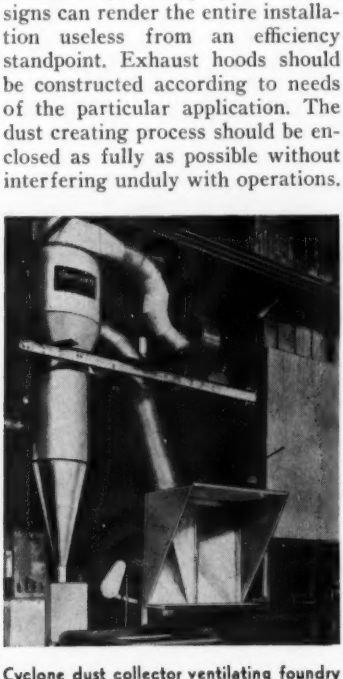
In the other corner of the casting finishing department two additional Roto-Clone dust collectors are installed as shown in figure 3. One exhausts four grinding wheels in the usual manner. The second Roto-Clone installation is of particular interest, collecting the dust from the work bench where grinding or filing of small parts is done. In this case, four exhaust grills, three square feet in area, have been provided in the work bench top, and located directly behind the vice at each station. Most efficient use of the exhaust air has been obtained by the installation of deflecting hoods to concentrate the air movement at the vice area. These hoods have been designed so they can be readily moved if they interfere with any given operation. The complete fabrication and installation of this system was made by the Kirk & Blum Manufacturing Co.



Hoods and Pipings in *Exhaust Systems*

By **C. A. SNYDER, Dust Control Engineering, American Foundry Equipment Co., Mishawaka, Indiana**

THE most efficient dust collector is but half of a dust control installation, and improper hood designs can render the entire installation useless from an efficiency standpoint. Exhaust hoods should be constructed according to needs of the particular application. The dust creating process should be enclosed as fully as possible without interfering unduly with operations.



Cyclone dust collector ventilating foundry shakeout. Special engineering gives this job extra benefits.

Photos courtesy American Foundry Equipment Co.

Hoods must be designed to take advantage of the force and direction of the dust particles leaving the operation creating the hazard. It must be remembered that air velocities in front of an exhaust hood drop approximately inversely with the square of the distance from the opening.

Keep hoods free from sharp edges and reinforce if necessary. Hinged sections are required for quick access for replacements, as in grinding wheel installations.

Piping should be run in a direct line to the dust control system if possible, and not interfere with cranes, trucks, etc., being accessible for inspection and cleaning or repairs. Where abrasive wear is encountered, it eventually is cheaper to install heavy pipe with flanged bolted joints.

Changes in pipe sizes should be made with a gradual taper of 5 inches length to every inch in diameter, preferably keeping the bottom of the pipe straight its entire length. Branch pipes should enter the main near the large end of the taper preferably on the side or on the top of the pipe. The branch should enter at an angle of 5 to 20 degrees with the axis of the main. Except in special cases, the area of the main pipe at any point should equal the sum of the area of all branch pipes behind the point. Pipes should be supported amply and cleanouts with tight covers should be installed at intervals on horizontal runs, and at bends, dead ends, and where dust is most likely to settle.

Arrange for pipes to be kept free of obstructions, and branches not to project into the main. Joints should lap in the direction of flow.

Elbows should be well formed, those pressed from one sheet with reinforcing ribs being preferable. The centerline radius should be twice the pipe diameter where possible, or a throat radius of 1½ diameter. Elbows should be constructed of material two gages heavier than corresponding sizes of straight pipe.

Blast gates, for balancing the system, should be located in the branch pipes at points that are accessible. Means should be provided for fastening the gate slide in the desired position.

It is recommended that the following gages be used:

4 to 12 inches diameter No. 20 gage.

12 to 32 inches diameter No. 18 gage.

32 inches diameter or over No. 16 gage.

Joints should be riveted and soldered or welded.

Important Points

Some important points relative to design of suction hoods and nozzles in a dust control system are as follows:

1. Use forces created by motion of tool on work to produce air currents into hoods.

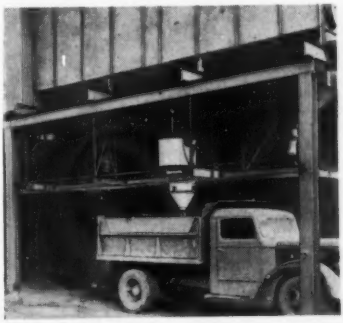
2. Prevention of air currents detrimental to above action by installation of proper baffles.

3. Study of existing air currents around operation that might effect hood efficiency, that is general building ventilation or adjacent operations.

4. Hoods must be as close as practical to operation creating dust due to rapid drop in air velocity away from face of hood.

5. Heavy gases or dust are usually handled by employing downward current of air into a hood.

6. Fumes are usually best handled by hoods utilizing an upward flow of air.



Wet disposal unit discharging sludge from large dust collector

7. If either of the above would interfere with the process, cross draft or lateral draft may be employed.

8. Hoods must be designed so that the hazard is drawn away from the face of operators.

9. Double walled hoods employing a high velocity curtain of clean air entirely around the operation are often applied effectively to shakeouts, etc., although this type of hood is patented.

10. It is generally agreed that an exhaust hood should not have more than 16 times the area of the exhaust pipe connected to it.

(please turn to page 24)

Designs for Dust Control

THE development of any type of engineering control for the protection of industrial health must be based on: (1) A specific job analysis of the operation or operations performed; (2) A study of operator technic; (3) Engineering and scientific data for developing control of the hazard involved.

To the layman there is no glamour to a drawing or an exhaust system, but to control engineers who, with the physician and chemist, form a tripod of attack for the protection of industrial health in the plants of this country, a properly designed and satisfactorily functioning exhaust system signi-

fies something that is alive for it represents positive protection for the health of industrial workers.

Fumes and Odors

Certain industrial operations are productive of annoying and irritating fumes and odors. Among these may be mentioned acrolein which results from the decomposition of oil or materials containing oils or fats.

In the manufacture of strip copper, the billet, having been previously brought to proper rolling temperature in a preheating furnace, is carried to the roll table in front of the reducing rolls by means of an electric hoist suspended from an overhead monorail. It is then passed back and forth through the rolls to be reduced to the required gauge. The insides of the rolls are water-cooled. The surface of the rolls is swabbed with a special grease mixture to prevent the formation of scale or oxidation of the surface of the copper slab.

In view of the fact that two operators are located directly in front of the roll table on the entering side or front of the rolls, one operator being located on the rear or leaving side, while a gauge operator on the side of the rolls regulates the roll displacement as the slab passes back and forth through the rolls, it was thought that the control of the dissemination of steam, flame, and large volumes of acrolein vapors could not be satisfactorily accomplished.

This operation has been performed for many years without any control. As a result, the interior of the building structure directly above the rolls is covered with a hard deposit of carbonaceous material, which, aside from being unsightly, also presented a fire hazard. On days when the humidity was high or when doors and windows were closed during the winter, the heavy vapors dispersed throughout the entire shop area to the discomfort of all workers.

B. F. Postman, M.E. of Connecticut's State Health Department is particularly well qualified to discuss the practical application of industrial ventilation for the control of occupational exposures.

Exhaust Vapors

About a year ago an attempt was made to catch and exhaust these vapors. A sheet metal hood 7′ x 7′ was located directly over the rolls and about 12′ above the floor line, so as to clear all of the monorail structure. A 12″ dia. exhaust duct was connected to this hood and approximately 3,000-3,500 c.f.m. were exhausted.

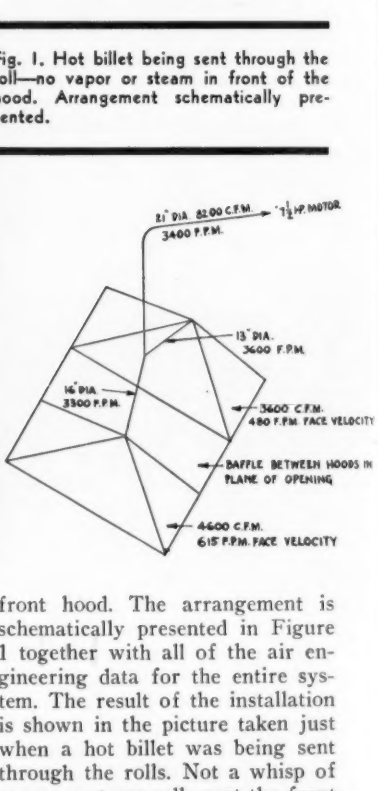
The original motor on the job was 7½ H.P. As soon as the system was operated it was found to be inadequate. The motor was changed to a 10 H.P. and then to a 20 H.P. with the hope that more air would be exhausted. Not realizing the relationship between fan performance and system characteristic, a point was soon reached where excess power was consumed without additional control at the rolls.

The present installation is the result of a proper analysis of the various factors involved. The location of the preheating furnace relative to the rolls precluded any different method of billet handlings than that which is at present being used, i.e., the overhead monorail and chain-hoist is one controlling factor in the location of any exhaust hoods or ducts. To catch the steam, flame, and acrolein vapors

effectively, any hoods must, of necessity, be close to the rolls. They could not extend very far forward or to the rear of the rolls due to the presence of the three operators.

The front hood location was practically set as it could not come forward of the point where the hoist-chain was located when the billet was lowered to the roll slab. Again, hoods could not be dropped below the heads of the operators in front or rear of the rolls nor could panels be dropped on the sides of the hoods, for they would interfere with the vision of the gauge operator. Since most of the irritating acrolein vapors from the rolls were generated in front as soon as the hot billet came in contact with the greased cool roll, more air was exhausted from the

Fig. 1. Hot billet being sent through the roll—no vapor or steam in front of the hood. Arrangement schematically presented.



front hood. The arrangement is schematically presented in Figure 1 together with all of the air engineering data for the entire system. The result of the installation is shown in the picture taken just when a hot billet was being sent through the rolls. Not a whisp of vapor or steam rolls past the front edge of the hood.

The elimination of this exposure is based entirely on engineering control. The system calls for large air volumes and high face velocities at the lower face of the exhaust hoods, 615 f.p.m. and 450 f.p.m., respectively.

Lead

An unusual lead exposure presented itself in the manufacture of an electrical specialty.

A call was received from the plant owner that some of his female employees were becoming ill. One of the girls had complained of severe abdominal pains.

The section of the plant where the trouble developed was a partitioned portion 26′ long x 13′ wide and 11′ high. One long and one short side contained movable steel sash. Three female and two male operators performed certain operations incident to the manufacture of these specialties.

A survey of the work area and a cursory examination of the operators indicated a possible lead exposure, though the owner stated that as far as he knew, no lead of any kind was present in any of the materials used in the manufacture of his products. Samples of all the materials used in the process were obtained and analyzed by our chemists. One of the materials contained between 50 and 60 per cent lead, presumably as a borosilicate. The owner communicated with the manufacturer of this material and was informed that "it did contain a considerable amount of lead."

Recommendations

As a result of the first lead study which showed lead concentrations ranging from 7 to 15 mg./10 M^3 (7-15 mg. per 10 cu.m. of air), the following recommendations were transmitted with the report and thoroughly discussed with the management.

1. Bottles of drinking water and milk should be removed from the work area. When workers require water they should be supplied with paper cups or a bubbler fountain should be provided and located outside the work area.
2. Candy, chewing-gum, or food of any kind should not be eaten in the work area.
3. An inclined tumbling barrel wherein the ingredients were mixed should be removed from the work area and placed in an isolated enclosure, said enclosure to be provided with a propeller fan for general ventilation.
4. The operator working in the area wherein the tumbling barrel is located, should be provided with and use a respirator approved for protection against the inhalation of lead dust.
5. Specific recommendations were outlined covering changed technic in the mixing, dumping, and storage of the mixed materials.
6. Female operator technic of flipping flannel cloths against legs of the supporting table to remove excess material dropped from the specialties during their progress in the work

(please turn to page 26)

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BLOWERS REMOVE INDUSTRIAL FUMES

Word and picture description of a well ventilated plant

B. Mercil and Sons Plating Company of Chicago, electro-platers since 1876, specializes in cadmium, zinc, nickel, brass and copper plating; black oxidizing; and electro tin and electro lead plating. With injurious fumes arising from various processes, a system of ventilation involving rapid removal of vapors is essential.

In most cases this is a "spot" ventilation job, because the corrosive vapors cannot be mixed together in a common duct system. Also, restricted floor space makes necessary extremely compact installations of the various "spot" ventilation systems.

Reduces Hazards

Approximately 15 years ago this company started to use direct-connected blowers on each of these "spot" ventilation jobs and have added new blowers as processes are changed or new processes added. The company has found that fumes are rapidly exhausted, reducing the accident hazard, increasing employee comfort and efficiency and practically eliminating equipment depreciation which would otherwise be caused by con-

Reading top to bottom Figures 2, 3 and 1

densation of acid-bearing vapors.

Fitted with lead-lined housing and wheel to counteract the corrosive quality of the fumes being exhausted, some of the blower equipment is still in daily operation after a decade of service.

Each of the photographs shown present an interesting application of blower equipment for the removal of harmful fumes. Figure 1 is that of a brass plating tank containing cyanide solution which has slotted hood around tank through which fumes are quickly removed by an overhead blower.

In Figure 2 through slotted hoods above tank containing potash solution used in metal cleaning operations, fumes are immediately removed by a blower, delivering 4440 c.f.m. at 1" static pressure.

In Figure 3 immediately above porcelain crocks which contain sulphuric, nitric and hydrochloric acids used in cleaning scale from metal prior to brass plating are a series of slots in a ventilating hood. Through these slots, noxious fumes are exhausted by a blower. Mounted overhead, no valuable floor space is wasted.

Such installations are not unusual but they do require steadfast cooperation. Manufacturers must learn to put their ventilating problems in the hands of competent engineers.

Photos and data courtesy of ILG ELECTRIC VENTILATING CO.

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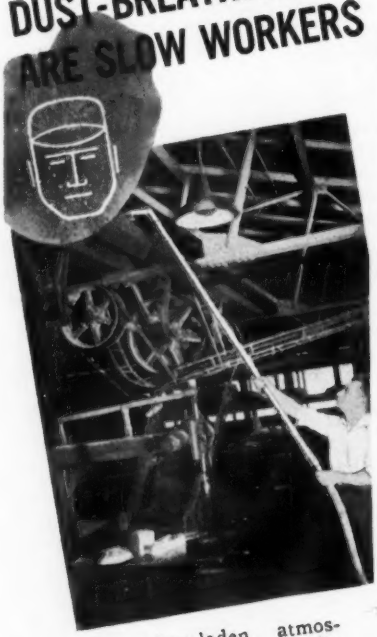
DUST-BREATHERS ARE SLOW WORKERS



Insidiously, dust-laden atmosphere slows up the workers who breathe it—and your production suffers accordingly! To stir up the dust by old-fashioned cleaning methods only aggravates the trouble. If your employees are to be freed of this menace, dust must be eliminated—not just redistributed. Vacuum cleaning is the only solution and Hoffman engineers will recommend the most efficient and economical system to meet the needs of your plant.

Send for Booklet "THE MENACE OF DUST"

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Air Appliance Division
98 EAST 12TH ST., NEW YORK, N. Y.

Autovent Company Purchased

The Herman Nelson Corporation, Moline, Illinois announces that it purchased the entire assets and business of the Autovent Fan and Blower Company, Chicago, Illinois.

The business will be operated as the Autovent Fan and Blower Division of The Herman Nelson Corporation. The complete line of Autovent products will continue to be manufactured in the Autovent Division in Chicago.

Included in the Autovent line are a complete range of sizes of centrifugal blowers from 6″ in diameter to 72″ in diameter, in both forwardly and backwardly curved blade designs and a complete selection of propeller exhaust and ventilating fans from 12″ in diameter to 72″ in diameter.

Words of Wisdom

William S. Knudsen says: "Safeguarding the health of our employees is, in my opinion, the greatest and most important task before us at all times."

What has LAN-O-KLEEN* got that the others haven't?

A high percentage of lanolin oil.

* Reg. U. S. Pat. Office

WEST DISINFECTING CO.

WHICH LEHIGH SERVICE FITS YOUR PLANT?

A great many LARGE industrial plants use so many thousands of pairs of safety shoes each year that they find it fastest, simplest, most economical to carry a full selection of Lehigh Safety Shoes in their own fully equipped SAFETY DEPARTMENT. The impressive foot-safety records established by these plants speak amply for the efficiency of this system wherever practical.

But suppose your small plant does not have a regular Safety Department, yet you want safety-shoes "engineered" to lick the special problems of your industry? Lehigh carries an enormous stock of patterns, sizes and widths, from which we can serve you with ONE pair or HUNDREDS... *as ordered by employees...*

at no extra service charge on 48-hour delivery!

FOR FULL INFORMATION AT NO OBLIGATION WRITE:

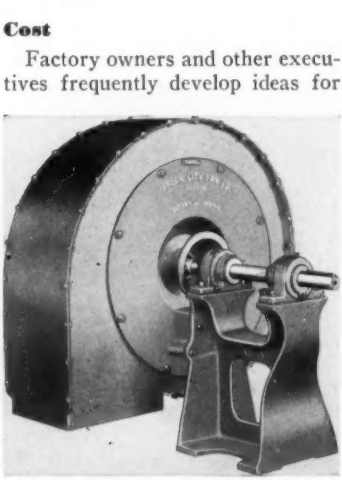
LEHIGH SAFETY SHOE CO. INC.
ALLENTOWN, PA.

Uses for Fans and Blowe

BENEFITS obtained by the use of fans and blowers in a variety of industries, have been greatly enlarged in recent years. This is due, in part to the studies and developments made by responsible fan and blower manufacturers, fortified by many years of experience, in applying fans and blowers for many different purposes. Such manufacturers are qualified to recommend the proper size and type fan or blower best suited for any particular service or result.

Cost

Factory owners and other executives frequently develop ideas for



Blowers for Industry

adapting fans and blowers to their manufacturing problems. In practically all such instances, the information which a reliable fan manufacturer can offer will prove helpful in obtaining the best results, with minimum first cost and maintenance. The information is available on request and anyone having problems in which fans can be utilized, should take advantage of the broad experience of a long established or responsible fan manufacturer.

Uses

Fans are used in industry to eliminate hazards, thus saving life, health and property, to speed up production, to lower costs and to improve the grade of uniformity of products.

Nearly all fan and blower applications can be included in the three following classifications:

1. Standard units for ventilating, exhausting, cooling or heating.
2. Semi-standard units for dust collecting, conveying and drying.
3. Special units as to design and construction for process work of all kinds.

Considerable dependable information is commonly known, pertaining to the kind of equipment used for the purposes covered in class one. Nevertheless, some incorrect installations are made, even for these purposes, although many more mistakes occur on applications included under the other two headings.

In the second and third classes, practically every application of the fan equipment should be considered as an individual problem. If an attempt is made to apply a certain standard fan unit to a service of

Photos courtesy Garden City Fan Co.

Blowers in Industry

some unusual kind or without taking into consideration surrounding conditions merely to save on the initial cost, a grave mistake can be made. The unit may require excessive power or cost of maintenance, or fail to render the complete result expected.

Applications

It is impossible to list all of the specific uses to which fans are applied in industries, but some of the uses are as follows:

Cooling
Drying
Circulating

Aerating
Conveying and Separating
Agitating Liquids
Creating Pressures or Vacuums
Handling Corrosive Fumes
Handling high temperature Gases

Dust presents real problems in many industries, not only as a potential fire or explosive hazard or interference with proper functioning of machines or a direct loss on account of the value of the dust, but most important, as a real menace to the health and lives of employees. To combat this problem every effort should be made to remove or collect the dust or other nuisance at the very source where it is created. The proper application of fan equipment will not only overcome hazards but can result in other valuable benefits.

ATHLETE'S FOOT IS THE ENEMY OF PRODUCTION

•

ALTA-CO IS ATHLETE'S FOOT'S WORST ENEMY

Alta-Co Powder works in a positive way. No mere disinfectant, this powerful but safe *fungicide* was developed to deal with Athlete's Foot and nothing else.

In the recommended solution, it kills Athlete's Foot fungi in less than 60 seconds. It remains stable in solution, and can be readily tested by anyone using the Dolge Alta-Co tester.

In these busy days, particularly, Athlete's Foot is nothing to fool with. Specify Alta-Co Powder for maximum protection.

Alta-Co Powder comes in white, stainless form, or with slight yellowish tracer as evidence of application.

THE C. B. DOLGE COMPANY
Westport, Connecticut

Right off the Docket

The trend of litigation on workmen's health and accident compensation is reflected in these briefs of the latest and most representative cases coming to trial in the intervals between issues. Familiarity with this trend is important to every industrialist.

Court Finds Safety Instructions Not Disobeyed

The decedent employee worked for a company which was engaged in the manufacture of concrete and steel pipe. A sand and gravel elevator 65 feet high was used to convey materials to a mixing bin. The employee's duties were to help operate the elevator, and to assist in repairing the elevator machinery, and to get it ready for the day's work. One of the company's safety instructions was that no one was to go to the top of the elevator shaft while the machinery was running.

One morning the employee was engaged in breaking up chunks of gravel and sand in the mixing bin 40 feet above the ground. This was the last time he was seen alive. Sometime later the foreman had the machinery started. It ran for a short time and then stopped suddenly. Upon investigation a wrench and the employee's cap were found at the foot of the elevator shaft. The employee's body was found at the bottom and inside the shaft.

The Court stated that an employer has the right to limit the sphere of employment of his employees, and may prohibit them from working in places which are dangerous to life and limb. Failure to obey such prohibitions will result in a denial of compensation. However, in this case it was inferred from the circumstances that the employee had gone to the top of the elevator shaft before the machinery was started and consequently had not disobeyed instructions. It was inferred from the finding of the wrench that the employee was in the performance of his duties of fixing the machinery when he was killed. An award was granted.

Larson vs *Lock Joint Pipe Co.* (Mich.) 298 N.W. 402 (June, 1941)

Complications Developing from Hernia Operation Held Compensable

While lifting a panel which contained 4 clamps, each weighing 15 to 20 pounds, a 58 year old cabinet maker sustained a strangulated right inguinal hernia. An operation was performed and the complications of a prostate obstruction, urinary sepsis, and broncho-pneumonia set in. The claimant was in the hospital three months.

In granting an award the Court stated: "Where postoperative complications suffered by compensation claimant grew out of operation for compensable nontraumatic inguinal hernia, and would not have ensued but for the accident, the complications were 'accidents' within the Workmen's Compensation Act, and were compensable."

Rugg vs *Driwood Corp.* (N.J.) 20 Atl. 2nd 365 (May, 1941)

Death Results from Exertion in Employment

The employee in this case, a man 65 years old, was employed as a

watchman. One day, after a heavy snowfall, the watchman was found near a gate, which he was under a duty to open and close, in a comatose condition. He was partially paralysed, and was totally disabled for a period of 7 months, at the expiration of which time, he died. Prior to this accident the employee had been suffering from arteriosclerosis.

The Court decided an award was justified. It found the death to be due to a cerebral hemorrhage which was precipitated or aggravated by the exertion of the man's work, including the shoveling of snow. This event was held to be a "personal injury by accident" arising out of and in the course of employment, despite the fact that the exact time of or place where the hemorrhage occurred could not be ascertained. It was brought on by exertion from the employee's work, on the premises of his employer, and was compensable.

Laird vs *State of Vermont Highway Dept.* (Vt.) 20 Atl. 2nd 555 (June, 1941)

Accident Held Compensable as Partially Contributing Cause of Disability

The claimant suffered two injuries to his back. There was a dispute as to whether the first injury, happening about a year prior to the second, was reported. The claimant did not become disabled until the second accident which resulted in multiple sclerosis.

The Court in making an award stated that even though the second accident may not have been the sole contributing cause to the claimant's disability it was at least an aggravation of a pre-existing condition, and compensable.

Davis vs *Lotz* (N.J.) 20 Atl. 2nd 602 (June, 1941)

Treatment for Back Injury Causes Flare Up of Latent Disease

A fireman suffering from an enlarged prostate gland sustained injuries to his back and groin while in the performance of his duties at a fire. Following necessary treatment for the injuries sustained, his prostate gland became infected and death resulted from such infection.

The Court made an award for the death of the fireman. It held that where a pre-existing disease is caused to become acute or flare up, and injury results therefrom rather than from the specific hurts received, the injury is compensable since the "proximate cause" is the accident which sets in motion the undeveloped or latent physical defect. Sound health at the time of injury is not the test.

Injury to Hand Causes Fatal Heart Thrombosis

This case in which an award for an injury resulting in death was granted. In July, 1937, while delivering milk, the decedent, 29 years old, lost his balance stepping from a porch to the sidewalk, fell on 2 milk bottles lacerating his left hand, ring finger, and left thumb. He received compensation for 5-4/7 weeks after which time he returned to work. He continued working until January, 1938, when he suddenly collapsed and died.

The employee's widow filed a claim for compensation for the death of her husband. Her contention was that the death was due to an embolus (blood clot) which originated in the injured hand and passed through the venous system into the heart, causing a fatal coronary thrombosis. The medical testimony was conflicting, some doctors claiming the injury to the hand caused the death, others stating there was no connection between the hand injury and the sudden decease of the employee. The Court held that there was sufficient evidence to justify an award to the widow.

Swalm vs *J. H. Brokhoff* (Pa.) 20 Atl. 2nd 797 (June, 1941)

Digested and Compiled by:
HILTON E. ROBERTS
Member of Ohio and New York Bar

Let the CENTRI-MERGE

solve your DUST and FUME *elimination problems*

PERFORMANCE proved by installations having a total capacity of over 4,000,000 C.F.M. The CENTRIMERGE method brings you these advantages: Cleaned air may be recirculated, resulting in greatly reduced heating costs. Cleaning efficiency is constant throughout its daily operating cycle. Cleaning efficiency is constant throughout the life of the unit. No shut downs for cleaning or routine maintenance required during normal working hours. Normal maintenance and disposal of collected dust *introduce no new health or fire hazard* as collected dust is automatically ejected in the form of sludge. Compact, self-contained unit construction permitting flexibility of arrangement. Engineered for long life and minimum maintenance expense. CENTRI-MERGE units are available, for use with present systems—or complete systems designed and installed to meet every requirement. A survey of your dust and fume conditions by our engineers is available to you, without obligation.

WRITE FOR BULLETIN C-M-3

SCHMIEG SHEET METAL WORKS

Engineers & Manufacturers

308 PIQUETTE AVE. **DETROIT, MICH.**

Name Changed to "Industrial Hygiene Foundation"

The Board of Trustees of Air Hygiene Foundation of American, Inc., Pittsburgh, Pennsylvania, announce the change of the organization's name to *Industrial Hygiene Foundation of America, Inc.* Reason for the name change is to more clearly describe the Foundation's expanding activities and membership services for the protection of employee health.

When the Foundation was organized emphasis was placed on silicosis, No. 1 industrial health problem at that time. With the rapid advances of industrial hygiene and the multiplication of new occupational health problems, the Foundation's work has steadily broadened.

A study is now underway, with the collaboration of the U. S. Public Health Service, to help reduce sick absenteeism which is costing the heavy industries alone about one billion manhours yearly. Other accomplishments include, continuing studies of X-ray techniques for large-scale physical examinations in industry; studies of the control of toxic fumes and gases, including proper precautions in welding; a research, now in progress, to develop further practical data on exhaust ventilation for employee health protection; investigations in "protector" dusts, including aluminum, to combat dust diseases.

The Foundation's sixth annual meeting will be held at Mellon Institute, Pittsburgh, on November 12 and 13. The program geared to produce practical data for today's needs, will revolve around the theme: Defend the Defense

Worker! Program suggestions are now being received from members of the Board of Trustees and the Medical, Engineering, Legal and Membership Committees.

Good Health Stops Accidents

Asked why he devoted much space to the subject of health and very little to the subject of accidents, Dr. Victor Heisler, medical consultant of the National Association of Manufacturers, gave as one reason the fact that he "believes that one of the best contributions to accident prevention lies in stressing proper health.

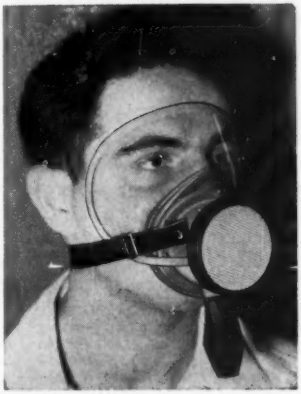
"The record has shown that a reduction of over 40 per cent in many companies following the establishment of health program.

"It can't be emphasised too strongly that if you take proper care of yourself, there will be much less chance of your having a mishap at the plant or elsewhere.

"It isn't a mere coincidence that of all the days of the week Mondays rank the highest in industrial accident rates. For, it is hardly a sensational statement to say that, being human, we're most of us likely to spend the weekend a little too strenuously, and therefore not be in top shape on Monday.

"Proper care of yourself—meaning proper diet, proper exercise, and proper sleep—is one of the best ways to avoid accidents, if the plant safety rules are also followed. And it is easier to remember to do that, too, if one isn't the victim of fatigue, of bad eating habits, or laziness brought on by too little exercise."

Pulmosan EYESHIELD RESPIRATORS



EXTRA PROTECTION FOR THE EYES in Dusts, Particles, Fumes, Sprays, Splashes

Originated by Pulmosan engineers, Eyeshield Respirators are making a big hit thruout industry. The Eyeshields are of strong, clear plastic, weighing only ½ ounce. They arch over respirator and fasten with headband snaps. Easily removed for cleaning or replacement. Full, unobstructed vision. Will not flap, twist or bend. Available in many Respirator models. Get details.

Write for Detailed Folder

Exclusive Pulmosan Features

1. Edges of Eyeshields bound with Felt, to prevent scratching the face.
2. Eyeshields fit closely to face; no twisting or bending; non-fogging, non-inflammable.

Pulmosan Safety Equipment Corp.

Dept. OH, 176 Johnson St., Brooklyn, N.Y.

Hood Designs

(Continued from page 9)

hoods should have simple, positive adjusting devices. Telescoping pipes or knuckle or ball joint in pipes are necessary with such hoods. Flexible metal or rubber hose can also be used with this hood.

Ample access doors should be provided for adjustment or replacements to equipment being ventilated. It is often desirable to light the interiors of hoods and provide dust tight windows for observation of the operation. Often an operation can be entirely enclosed by such a hood, the operator working through flexible gloves attached to openings in the hood.

12. Air velocities across the face of exhaust hoods will vary according to the application and the distance from hood face to operation, air currents in building, etc.

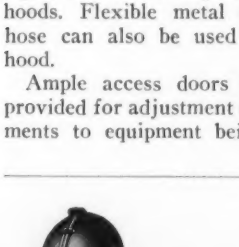
A statement in the first paragraph of this article is worth repeating: The most efficient dust collector is but half of a dust controll installation, and improper hood and piping designs can render the entire installation useless from an efficiency standpoint.

Valuable illustrated literature is available from experienced dust control installation contractors.

* * *

Rayon Plant Reduces Injuries

The Buffalo, New York rayon plant of E. I. duPont de Nemours & Co., set out a few years ago to



REDUCE HEALTH HAZARDS

GARDEN CITY FANS & BLOWERS

applied with experienced engineering skill get results. Health, fire and explosion hazards are greatly reduced.

For over 60 years we have been solving air problems for industry. Put this experience to work for you. Employee morale and productive time increase with proper ventilation. Submit your problem today. Write for time-tested recommendations.

GARDEN CITY FAN CO.
332 So. Michigan Ave. - Chicago, Ill.
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FOR SAFETY WITH COMFORT

DAVENPORT WOOD SOLE SAFETY SHOES

WOOD SOLE SAFETY SHOES protect your workers where underfoot conditions are too tough for ordinary shoes. Maple soles, cut for ease of walking, long outwear regular soles. Available with or without *Safety Toe*. WRITE FOR FREE CATALOG and latest prices!

F. J. STAHMER SHOE CO.
2351 Boise Ave., Davenport, Iowa

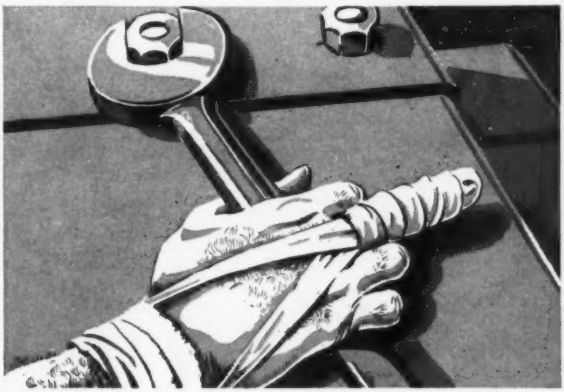
prove—as much to themselves as to anyone else—that most mishaps can be prevented.

How well their effort has succeeded was indicated in a report by Philip Williams, safety supervisor for the Buffalo duPont plants, that the number of eye injuries has been reduced more than 95% since 1937; there have been corresponding decreases in other types of accidents and no deaths whatsoever in recent years.

The company's safety campaign has been based on co-operation rather than regulation. Instead of issuing accident-prevention rules, the management invites the 2,500 employees to advance their own safety suggestions, and such measures get priority in the volume of inter-office communications.

Symbols of the accident prevention drive are to be seen all through the duPont plant; caution signs every few feet, large mirrors installed at angles at narrow corners to forestall collisions, 31 completely equipped fire stations, and disposal tins for matches, etc.

Mr. Williams believes the most effective precaution is the widespread use of safety goggles, to which he attributes the reduction from 561 eye injuries in 1937 to only 18 in 1940. The goggles—37 different styles are available—are now used by nearly every worker. The plant also has its own volunteer fire department—92 employees trained in fire-fighting.



Can we afford to let DERMATITIS slow down our Defense Program?

Workers' hands are industry's most important tools—tools that are today speeding up America's defense program. Help protect your workers' hands against skin infection and dermatitis with Formula SBS-11, the safe, industrial skin cleanser. Costs less than 1c a week per worker: removes grease and grime quickly and easily. Write today for generous free trial supply of Formula SBS-11 to Sugar Beet Products Co., 300 Waller Street, Saginaw, Michigan.

Formula SBS-II
THE WASHWORD OF INDUSTRY

A New "NOSER" for NUISANCE DUSTS

- DUPOR No. 1 "NOSER" has 9 sq. in. filtration area.
- Handy as a pair of glasses —weighs less than ONE OUNCE.
- Just breathe through nose as nature intended is all you do to operate!
- DUPOR No. 1 has patented valve to exhaust stale air.
- Rubber nose piece gives dust-tight fit on any shape nose.
- Constructed of rubber, plastics and felt—no parts to corrode.
- Thousands of satisfied users in all industries.
- Sample "NOSER" $1.00 postpaid.

H. S. COVER
36 Chippewa St.
South Bend, Ind.

Designs for Dust Control

(Continued from page 13)

area should be immediately stopped. This operation alone was found to contribute considerable dust and lead to the general work area. These cloths were found necessary to protect the chrome-plated surface of the specialties from becoming scratched.

7. No cleaning of any kind should be performed during working hours—especially dry brushing of the work tables—but preferably after working hours and by an operator protected with an approved lead dust respirator. A small portable vacuum cleaner would be a desirable piece of equipment for this purpose.

8. The solid metal top of the 14′ long x 18″ wide work table should be provided with screen or grille sections at the operator stations, each grille section to be located over a hopper and each hopper to be connected to a main exhaust system to discharge outdoors to a dust collector.

9. Previous to any ventilation installation, and after the tumbling barrel has been removed, ceiling, walls, floor, windows, and work tables should be thoroughly flushed with water to remove all present dust deposits.

FOR SERIAL NUMBERING

SAFETY WEDGE GRIP HOLDERS AND TYPE

Hand Holder

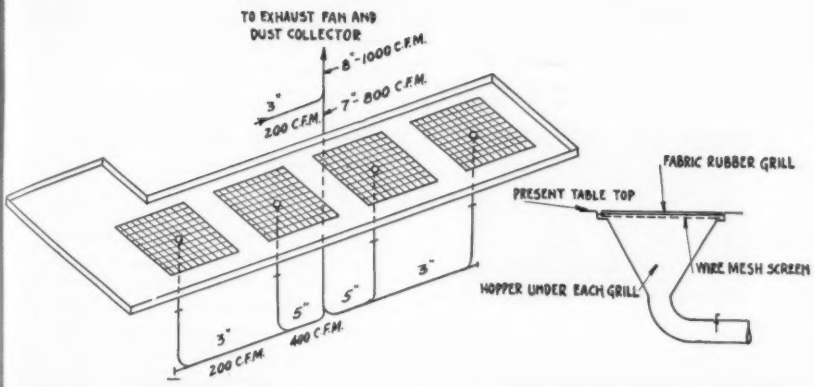
For numbering of airplane parts and other machine parts, bars, castings, etc. Safety Steel construction assures at least 50% more service and resists spalling and mushrooming. Patented Safety Snap provides fast medium for changing type inserts. Can be made for any size or number of characters.

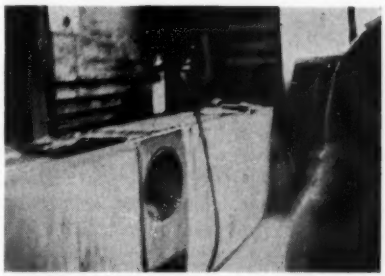
Steel type is made from either Safety Steel or a high grade alloy tool steel to assure more service. Made with any size character. Can be made for use with your present equipment or for use in the above Safety Holders.

Steel Type

Write for circular

M. E. CUNNINGHAM CO.
91 E. Carson St. Pittsburgh, Pa.





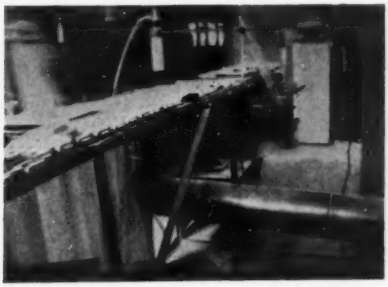


Fig. 2. Schematic arrangement for down draft ventilated table. A and B, front and rear views of attempted control.

Recommendations 1, 2, 3, 4, 5, 7, and 9 were immediately complied with. Suggestion 8 is schematically illustrated in the upper portion of Figure 2. At each working position a rubber covered grille about 18" x 10" is set into depressions in the working face of the table as shown in the upper right-hand section of the sketch. Each grille is to handle about 200 c.f.m. at a net face velocity through the opening of 100 f.p.m., and a fan unit is to provide 800-1,000 c.f.m. exhaust capacity. Duct velocities averaged about 3,000 f.p.m.

The first attempt by the management is shown at "A" and "B." The solid top of the table was replaced by a heavy wire mesh set between the angle iron edges of the table. On top of this mesh were placed small fabric-rubber mats. Canvas curtains were placed along the front of the table down to the floor. At each work station, though not shown in either of these illustrations, inclined solid metal trays

Greater Resistance
TO PITTING

WHILE ordinary safety lenses became so pitted as to be unfit for use after only 16 hours, in an actual flash-welding service test, Tulca Lenses were still in excellent condition after more than 100 hours.

Send goggle frames to be fitted with sample Tulca Lenses for testing in your own plant. No obligation. TULCA DIVISION, The Univis Lens Company, Dayton, Ohio.

TULCA

NON-SHATTERING MATERIAL
SAFETY LENSES

extended from the under side of the mesh grille to toteboxes on the floor. These were to catch any material dropped through the grille top from the specialties as they progressed from the operation to operation along the top of the table.

About half way along the length of the table a metal panel was located, containing a 12″ dia. copper reflector, salvaged from a reflector-type bathroom heater. The inside of the reflector was connected to a 6″ dia. inlet of a small direct-connected fan unit operated by a ⅛ H.P., 1,740 r.p.m. motor. The 3″ dia. outlet of the fan was located inside a 6″ dia. stove-pipe, shown at "B." This pipe extended through a hole in the building wall to the outside. Neither trap nor collector was connected to the end of this pipe.

The idea of the reflector and fan installation was for the operators to flip their flannel cloths against the grille in front of the reflector so that all the dust would be immediately exhausted outdoors. When not so used, the fan was supposed to aid materially in purging the general work area of lead dust.

From an engineering standpoint, the installation was entirely psychological and typical of many industrial exhaust installations operating today.

Dust Study Made

After these changes, a second dust study was made, sampling points being the same as in the first study. Atmospheric lead concentrations ranged from 4 to 5.5 mg./10 M^3. This was a considerable reduction from the 7 to 15 mg. range of the first study. The reduction in concentration is to be attributed to the removal of the inclined tumbling barrel from the work area, some improved operator technic, and especially the purchase of a portable vacuum cleaner, the effective results of which were immediately manifested by the improved housekeeping and reduction of deposited dust throughout the work area.

The results of the second study were transmitted to the management and interpreted to the extent

that a serious lead hazard still existed in this work area. The downdraft ventilated grilled-top hoppers were then installed. Slide type blast gates were installed at each hopper to regulate the air-flow. A cyclone dust arrestor was also located outside the building wall between two wings of the plant buildings.

The only criticism that the management had of the ventilated hoppers was that they were trapping and exhausting to the dust arrestor about 16 per cent of the material daily prepared to be used in the electrical specialties. This seemed too great a loss, so modifications to the system were immediately made. Dust traps were made for the bottom of each hopper. These traps, 11″ dia. x 19″ high, caught practically all of the heavy material while only the fine dust, not necessary for the specialties, was exhausted to the arrestor outdoors.

No further sickness or complaints of any kind have been received by the management from the workers in this section since the new ventilation system has been in operation. Up to date, bureau activities have prevented a final check study but this will be made in the near future.

The elimination of this exposure is based on chemical and engineering control. Closer medical control through early and continued basophilic aggregation tests would have been of material aid in the solution of this serious exposure.

* * *

This article will be continued. Additional designs will be pointed out. *(Courtesy American Journal of Public Health.)*

MAKE PLANS NOW

Two Important Meetings of vital interest to every person in this field are scheduled for October.

Oct. 6-11—National Safety Congress, Stevens Hotel, Chicago, Illinois.

Oct. 20-24—National Metal Congress, Convention Hall, Philadelphia, Penna.

PLAN TO ATTEND

New way to solve

ATHLETE'S FOOT

problem

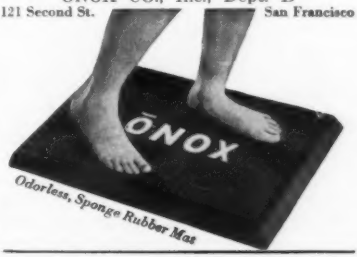
If you have shower rooms, your problem is ever present. Your employees are exposed to infection every day. Our problem is to convince you that ONOX is not "just another one of those Athlete's Foot remedies."

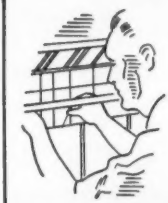
Recent research has upset former theories regarding the prevention of Athlete's Foot. ONOX is revolutionary. A safe non-poisonous skin toughener does the work. You may test it under any conditions you choose to impose and without obligation. For example:

- ***We will ship prepaid, your trial order for any amount of ONOX and equipment. Use it for 60 days. If at the end of that time ONOX has not proved itself to your complete satisfaction (100%) you owe us nothing and return nothing. This offer is open at any time to established industrials.***

We would like to send you the simple details of the ONOX method now used by hundreds of institutions from Coast to Coast.

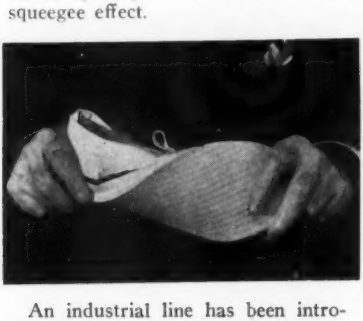
ŌNOX CO., Inc., Dept. B
121 Second St. San Francisco





New Ide... IN THE FIE...

NON-SLIP SOLE—The Sperry Shoe Division of the United States Rubber Company has adapted for industrial footwear a squeegee sole that was originally developed to grip the slippery deck of a racing yacht. In action thousands of small rubber waves open up to create the suction-squeegee effect.



An industrial line has been introduced which includes an all-white patrol rubber, an all-white Terre Haute, a light, short boot, hip length boot, and special marine boot.

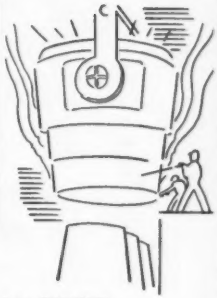
Other types are expected to be developed as a result of a continuing study of industrial needs in this line. U. S. Rubber has asked that all companies who have special problems with damp, oily or other slippery surfaces submit them for consideration.

FINGERLESS GLOVE—A new "fingerless" glove meets the unusual requirements of operators who must have complete freedom of the fingers; "touch" to sort of pick up thin sheets or small parts. Complete protection, however, is provided for the palm of the hand and between thumb and fore finger. Industrial Gloves Company of Danville, Illinois has recently perfected this new glove as illustrated.

In addition to being made of chrome tanned long wearing split leathers, the glove is steel stitched which eliminates the possibility of ripping—an expensive and dangerous weakness in makeshift "fingerless" gloves. The glove may be worn over the bare hand or pulled over light weight glove. Available in three sizes—small for women operators, medium and large for men.

BOOKS—*Industrial Health—Asset or Liability*, by C. O. Sappington, M.D., Dr. P.H. is another of the doctor's valuable contributions to the industrial

...Ideas ...FIELD



hygiene field. This 306 page book suggests plans for industrial health programs, deals with such special problems as Fatigue, Ventilation, Illumination, devotes a special section to forms used for this work.

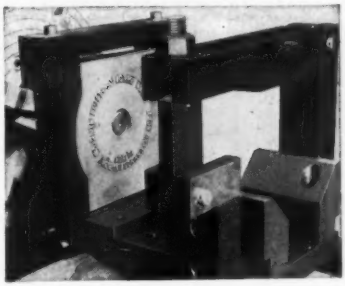
Dr. Sappington is also the author of *Medicolegal Phases of Occupational Diseases.* The books are being distributed by Industrial Health Services, 330 South Wells Street, Chicago. Both are timely and of important interest to the industrial field.

"NEW IDEAS IN FUNCTION FLOOR DESIGN" is the title of a 16-page handbook on the many uses of open steel floor grating just published by the Open Steel Flooring Institute. The Handbook has been prepared by the Institute to provide detailed technical and working knowledge of the several types of open steel floor grating, riveted, welded and interlocked, manufactured by its members.

Included in its contents are a Table of Safe Loads based on U. S. Government specifications—a typical hypothetical floor layout—detailed clipping or fastening diagrams—suggested specifications. Dozens of illustrations of open steel flooring installations show the wide range of application of the product.

A copy of "New Ideas in Functional Floor Design" may be secured free of charge by writing The Open Steel Flooring Institute, American Bank Building, Pittsburgh, Pennsylvania.

SHELL STAMPING MACHINE—A simple, but unique stamping machine for stamping details on base of finished shells is announced by the M. E. Cunningham Company. This machine can be fitted into production lines with a minimum of setting up cost. Because of design the machine can be furnished as a complete motor driven unit or as a fixture for setting up on an ordinary lathe.



Each character is driven into the shell *separately,* eliminating the need for great pressure or shock necessary to get a deep, clear impression. Because of the minimum of strain on the shell in making the impression fewer rejections result because there is no possibility of fracture or strains being set up during the marking operation, according to the manufacturer.

This machine can be made for any size shell and the type holder can be made for any required set-up.

Useful FREE LITERATURE

The literature briefly described in this department gives important information on products and equipment designed to control occupational hazards. Manufacturers' technical executives tell of the features to be found in their goods. Be sure to get all available data through this literature before buying. Note those items desired on coupon below and mail.

441—**SAFETY SHOE CATALOG—LEHIGH SAFETY SHOE CO.**—New catalog is complete buying guide to broad selection of safety shoes. Full details given on what to specify, on shoe construction and their free aids to footsafety promotion.

442—**WIRE ROPE CATALOG—MACWHYTE COMPANY**—170-page catalog lists more than a thousand ropes. Is sectionalized for quick reference with a tabbed index. Informative and useful.

443—**INDUSTRIAL DUST CONTROL—PANGBORN CORP.**—Booklet prepared by their chief engineer for the purpose of acquainting plant executives with dust control means through the medium of exhaust systems. Attractively gotten up.

444—**NON-SLIP FLOOR SURFACING—NATIONAL BRONZE AND ALUMINUM FOUNDRY CO.**—Bulletin points out uses for Ten-Lox anti-slip stair treads and floor tile. Sizes and specifications indicated.

445—**LIGHTING FIXTURES SPECIALTY—THOMPSON ELECTRIC CO.**—40-page catalog outlines the contribution of Thompson light fixture hangers to safety programs. Hanger permits lowering of lighting fixture out of the electrical circuit.

446—**WASH FOUNTAINS AND SHOWERS—BRADLEY WASHFOUNTAIN COMPANY**—A new Bradley book consists entirely of pictures with brief explanatory legends. Contains washroom installation views in plants of all kinds. A virtual "LIFE" of the industry.

447—**CENTRI-MURGE DUST CONTROL—SCHMIEG SHEET METAL WORKS**—Bulletin No. C-M-3 offers engineering advice for the control of dust by the Centri-Murge method, an installation whereby dust is reduced to sludge. Bulletin well conceived.

448—**WASHROOM HAND DRYING FIXTURE—CHICAGO HARDWARE FOUNDRY CO.**—Bulletin points out industrial uses for automatically operated hand drying fixture. Actual installations, specifications and lists of users shown.

449—**RUST AND SCALE REMOVER—OAKITE PRODUCTS, INC.**—The third edition on Oakite Compound No. 32 includes much helpful information on the use of this material for effectively removing scale and rust. Many special uses are also reviewed.

450—**SLING AND CRANE CHAINS—S. C. TAYLOR CHAIN CO.**—A new series of bulletins bound in catalog form illustrate and describe many types and grades of their chains. Included are tables illustrating safe loads for chains and slings.

FREE LITERATURE COUPON Clip out and paste on postcard or enclose in envelope. Mail to: OCCUPATIONAL HAZARDS, 812 Huron Road, Cleveland, Ohio.

Nos. of desired items .....

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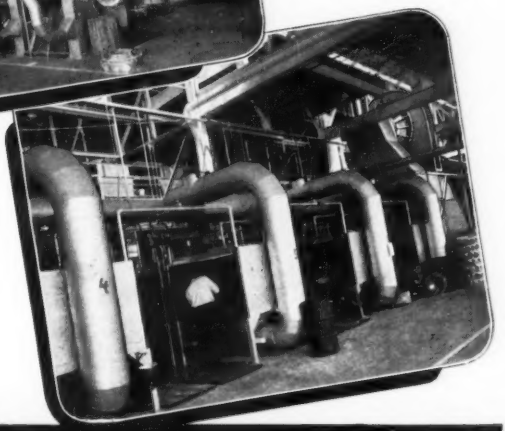
ROTO-CLONES assure

Complete dust control at the

WRIGHT AERONAUTICAL CORPORATION

Objectionable dust caused by abrasive cleaning, grinding, and casting finishing is collected in the new Wright Magnesium Foundry by six Type W Roto-Clones exhausting 103,000 c.f.m. Overhead exhaust ducts carry collected material to the Roto-Clones which combine in a single compact unit-exhauster, dust collector, and storage hopper.



The constant exhaust volume and use of water sprays in the Type W Roto-Clone assure rapid removal of dust generated by grinders, band saws, and at cleaning benches where castings are finished.

Write for complete descriptive bulletins on the Roto-Clone and its application to all abrasive cleaning dust problems.

●

American Air Filter Co., Incorporated
137 Central Ave., Louisville, Ky.

ROTO-CLONE *Dust Control System*

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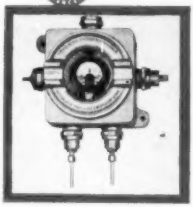
M.S.A. . . . "Safety Headquarters for American Industry" . . . with unequalled research facilities and experience provides the correct answers to your problems of gas indication, recording, and control.

M. S. A. EXPLOSIMETER
Model 1

The original pocket-size combustible gas indicator—widely employed wherever the need for periodic or intermittent testing of atmospheres for explosibility exists in industry. Contained in a durable, molded bakelite case—ready for use at any time.

M. S. A. *Explosion-Proof* COMBUSTIBLE GAS ALARM

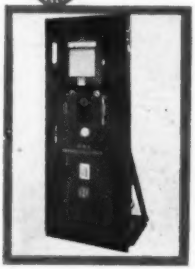


For safely and continuously sampling atmospheres where combustible vapors may be present—gives instant warning when predetermined concentration is reached. Completely contained in an explosion-proof conduit. May be adapted for automatic process control.

M. S. A. EXPLOSIMETER
Model 2

Meets the demand for a compact, simple and dependable combustible gas indicator where every day usage is required. One hand only is needed to operate the instrument—the other is free to handle a sampling line or probe. Employs standard flashlight batteries; one-piece flow system; built-in filter chamber.

M. S. A. OXYGEN RECORDER



Regarded as the most scientifically precise and dependable means of continuously measuring and recording oxygen in other gases, the M.S.A. Oxygen Recorder now is available completely assembled on a steel panel, simplifying installation and maintenance. A number of other important refinements are included, adding to this instrument's proved reliability.

M.S.A. COMBUSTIBLE GAS ALARM (not illustrated) can be provided with a multipoint testing system for sampling from four, six, or eight locations through one analyzer, and it can be interconnected with a recording potentiometer to produce a continuous graphic record of combustibles in the atmosphere tested. Other M.S.A. INSTRUMENTS FOR GAS DETECTION AND CONTROL include: Carbon Monoxide Detectors; Carbon Monoxide Indicators; Carbon Monoxide Alarms; Hydrogen Sulphide Detectors; Pyrotannic Detectors; and the improved Carbon Monoxide Recorder.

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In this ISSUE

THE PIPER AIRCRAFT PLAN ..... Pg. 8
HOW CRANE COMPANY WORKS 10
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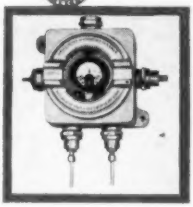

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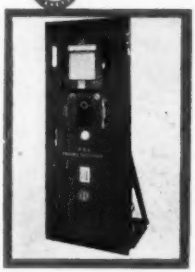

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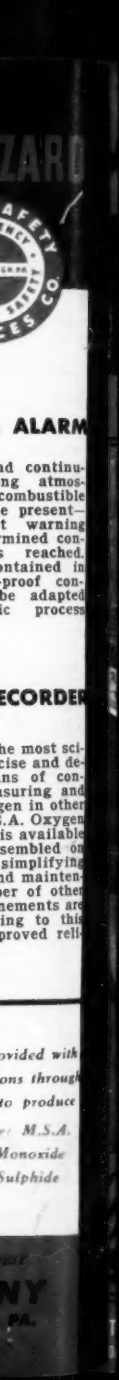
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